COURSE OUTLINE OF RECORD

Number: MATH G160  TITLE: Introduction To Statistics

ORIGINATOR: Gita Alemansour  EFF TERM: Spring 2019
FORMERLY KNOWN AS:  DATE OF
OUTLINE/REVIEW: 11-20-2018

CROSS LISTED COURSE:

TOP NO: 1701.00  CID: MATH 110

SEMESTER UNITS: 4.0
HRS LEC: 72.0  HRS LAB: 0.0  HRS OTHER: 0.0
CONTACT HRS TOTAL: 72.0
STUDY NON-CONTACT HRS RECOMMENDED: 144.0

CATALOG DESCRIPTION:

This course includes concepts and procedures of descriptive and inferential statistics; collecting, classifying, tabulating, graphing univariate and bivariate data; measures of central tendencies, variation, percentiles, probability, binomial, normal, T, Chi-square and F distributions; making inferences, decisions and predictions. This course develops statistical thinking through the study of and applications to data sets in the social and behavioral sciences, business, and other disciplines. The use of a graphing calculator and/or statistical analysis computer programs is integrated into the course. UC credit limitations: MATH G103, MATH G160, BIOL G260 and PSYC G140 combined – maximum credit, 1 course. C-ID MATH 110, C-ID SOCI 125

JUSTIFICATION FOR COURSE:

Align with CID

PREREQUISITES:

- GWC Math Placement Level of 50 or higher.
  or
- MATH G030: Intermediate Algebra with a minimum grade of C or better
  or
- OCC Math Placement Level of 50 or higher.
  or
- MATH A030: Intermediate Algebra with a minimum grade of C or better
  or
- CCC Math Placement Level of 70 or higher.
  or
- MATH C030: Intermediate Algebra with a minimum grade of C or better
  or
- MATH G080: Pre-Statistics with a minimum grade of C or better
  or
- MATH G040: Accelerated Elementary and Intermediate Algebra with a minimum grade of C or better

COREQUISITES:

ADVISORIES:

ASSIGNED DISCIPLINES:
Mathematics

MATERIAL FEE: Yes [X] No [ ] Amount: $0.00

CREDIT STATUS: Noncredit [ ] Credit - Degree Applicable [X] Credit - Not Degree Applicable [ ]
GRADING POLICY: Pass/No Pass [ ]  Standard Letter [X]  Not Graded [ ]  Satisfactory Progress [ ]
OPEN ENTRY/OPEN EXIT: Yes [ ]  No [X]
TRANSFER STATUS: CSU Transferable [ ]  UC/CSU Transferable [X]  Not Transferable [ ]
BASIC SKILLS STATUS: Yes [ ]  No [X]  LEVELS BELOW TRANSFER: Not Applicable
CALIFORNIA CLASSIFICATION CODES: Y - Not Applicable
NON CREDIT COURSE CATEGORY: Y - Not applicable, Credit Course
OCCUPATIONAL (SAM) CODE: E
REPEATABLE ACCORDING TO STATE GUIDELINES: No [X]  Yes [ ]  NUMBER REPEATS:
REQUIRED FOR DEGREE OR CERTIFICATE: No [ ]  Yes [X]
Administration of Justice (Associate in Science for Transfer)
Anthropology (Associate in Arts for Transfer)
Basic Associate Degree Program (Associate in Arts)
Business Administration (Associate in Science for Transfer)
Economics (Associate in Arts for Transfer)
Elementary Teacher Education (Associate in Arts for Transfer)
Elementary Teacher Education (Associate in Arts for Transfer)
Geography (Associate in Arts for Transfer)
Kinesiology (Associate in Arts for Transfer)
Liberal Arts: Emphasis in Business and Public Administration (Associate in Arts)
Liberal Arts: Emphasis in Business and Public Administration (Associate in Arts)
Mathematics (Associate in Science for Transfer)
Nursing -LVN to RN (Associate in Science)
Nursing- Registered Nurse (Associate in Science)
Political Science (Associate in Arts for Transfer)
Psychology (Associate in Arts)
Psychology (Associate in Arts for Transfer)
Sociology (Associate in Arts for Transfer)
GE AND TRANSFER REQUIREMENTS MET:
IGETC Area 2: Mathematical Concepts and Quantitative Reasoning
   2A: Mathematics
CSU GE Area B: Scientific Inquiry and Quantitative Reasoning
   B4 - Mathematics/Quantitative Thinking

COURSE LEVEL STUDENT LEARNING OUTCOME(S) Supported by this course:

1. Collect, organize, and summarize data through the use of graphs, calculate measures of central
tendency and dispersion, and describe the distribution.

2. Describe the normal distribution and compute the probability of an event involving a normally
distributed random variable.

3. Perform a hypothesis test for a population mean with unknown sigma and interpret the correct
   conclusion from the test.

4. Compute probabilities using probability rules, counting techniques, and probability distributions,
   including sampling distributions.

5. Calculate and interpret the p-value and significance level for a given data set.

COURSE OBJECTIVES:

1. Distinguish among different scales of measurement and their implications;
2. Interpret data displayed in tables and graphically;
3. Apply concepts of sample space and probability;
4. Calculate measures of central tendency and variation for a given data set;
5. Identify the standard methods of obtaining data and identify advantages and disadvantages of each;
6. Calculate the mean and variance of a discrete distribution;
7. Calculate probabilities using normal and t-distributions
8. Distinguish the difference between sample and population distributions and analyze the role played by the Central Limit Theorem
9. Construct and interpret confidence intervals;
10. Determine and interpret levels of statistical significance including p-values;
11. Interpret the output of a technology-based statistical analysis;
12. Identify the basic concept of hypothesis testing including Type I and Type II errors;
13. Formulate hypothesis tests involving samples from one and two populations;
14. Select the appropriate technique for testing a hypothesis, and interpret the result;
15. Using linear regression and ANOVA analysis for estimate and inference, and interpret the associated statistics;
16. Use appropriate statistical techniques to analyze and interpret applications based on data from disciplines including business, social sciences, psychology, life science, health science, and education.

COURSE CONTENT:

LECTURE CONTENT:

A. Note: Applications in this course use data from disciplines including business, social sciences, psychology, life science, health science, and education, and include statistical analysis using graphing calculators.

B. Data
   1. Collection
   2. Classification: levels/scales of measurement
   3. Organization
   4. Summarization
      a) Graphing
      b) Measures of Central Tendency
      c) Measures of Variation
      d) Percentiles and Quartiles

C. Probability
   1. Empirical and Mathematical Probabilities
   2. Probability Rules
   3. Probability Distributions: Discrete and Continuous
      a) Binomial
      b) Normal
      c) T
      d) Chi-squared
   4. Random Variables and Expected Value

D. Sampling
   1. Methods
   2. Central Limit Theorem
   3. Sampling Distributions

E. Statistical Inference
   1. Confidence Interval Estimate
      a) Error of estimate
      b) Size of sample
   2. Hypothesis Testing
a) Level of Significance and P-value
b) Type I and II errors
3. Inferences from one sample
   a) Estimates of population mean and proportion
   b) Testing a claim about mean and proportion
4. Inferences from two samples
   a) Inferences about two means
   b) Inferences about two proportions
5. Chi-Squared tests
6. ANOVA

F. Linear Correlation and Regression
   1. Scatter Diagram
   2. Pearson Correlation Coefficient and coefficient of determination
   3. Regression Line
   4. Prediction

G. Calculator and computer applications
   1. Working with data
   2. Simulations
   3. Inference

H. Optional Topics
   1. Poisson Probability Distribution
   2. Inferences for standard deviation and variance
   3. Post hoc test for ANOVA
   4. Two-way ANOVA
   5. Non Parametric Tests
   6. Quality control

METHODS OF INSTRUCTION:

A. Lecture:
B. Tutoring – noncredit:
C. Dist. Ed – Delayed Interaction:
D. Online:
E. Independent Study:
F. Hybrid:

INSTRUCTIONAL TECHNIQUES:

COURSE ASSIGNMENTS:

Reading Assignments

A. Required Reading such as:
   Textbook assignments that require comprehension, and application of statistical concepts.
   Statistical study from a current journal

Out-of-class Assignments

1. Individual and/or group projects.
2. Calculator and/or computer assignments

Writing Assignments

1. Complete written solutions to homework, quiz, and test problems.
2. Written reports and/or projects.
3. Demonstrate use of calculator and/or computer in analyzing and comparing data.
METHODS OF STUDENT EVALUATION:
Midterm Exam
Final Exam
Short Quizzes
Written Assignments
Essay Examinations
Objective Examinations
Report
Projects (ind/group)
Problem Solving Exercises
Oral Presentations
Skills Demonstration

Demonstration of Critical Thinking:
1. Read a problem, interpret it and apply the statistical concepts necessary for its solution. 2. Interpret the results of data analysis. 3. Draw conclusions about a population based upon data obtained from a sample.

Required Writing, Problem Solving, Skills Demonstration:
1. Complete written solutions to homework, quiz, and test problems. 2. Written reports and/or projects. 3. Demonstrate use of calculator and/or computer in analyzing and comparing data.

TEXTS, READINGS, AND RESOURCES:

TextBooks:

Other:
1. TI-83/83+/84/84 Graphing calculator

LIBRARY:

Adequate library resources include: Print Materials
Non-Print Materials
Online Materials
Services

Comments:

Attachments:

Attached Files